

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-7, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuzawa et al. (U.S. Pat. 6,080,292) in view of Abry et al. (U.S. Pat. 5,993,615).

Regarding claim 1, Matsuzawa et al. teach a sputtering target monitoring system. A sputtering source in a vacuum chamber. (See Fig. 1; Column 5 lines 41-43) A power supply 2. (Column 2 lines 63-67; Column 3 lines 1-3) A sensor box A is connected to the sputtering source and the power supply 2, the sensor box including a current-based arcing sensing device. (Column 3 lines 1-3; Column 4 lines 45-57) A data collection box connected to the sensor box. (Column 5 lines 8-10)

Regarding claim 2, the sensor box comprises a voltage circuit, a current circuit and a current-based arcing sensing device. (Column 4 lines 45-67)

The differences between Matsuzawa et al. and the present claims is that a network connected to the data collection box is not discussed (Claim 1), the data collection box further comprising software for collecting and displaying collected data from the sputtering source is not discussed (Claim 3), the data collection occurs according to a voltage sensed in the voltage circuit exceeding a threshold value in the sputtering source is not discussed (Claim 4), the arcing events correspond to current spikes sensed in the sputtering source beyond a threshold value is not discussed (Claim 5), the arcing events correspond to current interruptions sensed in the sputtering source is not discussed (Claim 6), the network being directly linked to the sputtering system is not discussed (Claim 7), the data collection box displaying real time display of data collected (Claim 9) and the real time data being one of table format and a graphical format is not discussed (Claim 10).

Regarding claim 1, Abry et al. teach utilizing a network connected to the data collection device. (Column 3 lines 26-30)

Regarding claim 3, Abry et al. teach providing software for collecting and displaying collected data from the sputtering source. (Column 4 lines 9-17)

Regarding claim 4, Abry et al. teach the data collection occurs to a voltage sensed in the voltage circuit exceeding a threshold value. (Column 3 lines 63-67; Column 4 lines 1-17)

Regarding claim 5, Matsuzawa et al. already discussed teach that the data can be collected according to current spike sensed in the sputtering sensed in the sputtering source beyond a threshold value. (Column 4 lines 58-67)

Regarding claim 6, Matsuzawa et al. already discussed teach that the arcing events correspond to current interruptions sensed in the sputtering source. (Column 4 lines 58-67)

Regarding claim 7, Abry et al. teach the network being directly linked to the sputtering system. (Column 3 lines 26-30)

Regarding claim 9, Abry et al. teach the data collection box displaying real time display of data collection. (Column 4 lines 8-17)

Regarding claim 10, Abry et al. teach the real time data being one of graphs. (Column 4 lines 8-14; Column 4 lines 42-43)

The motivation for utilizing the features of Abry et al. is that it allows for preventing yield loss due to arcing. (Column 2 lines 9-10)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Matsuzawa et al. by utilizing the features of Abry et al. because it allows for preventing yield loss due to arcing.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abry et al. in view of Matsuzawa et al. as applied to claims 1-7, 9 and 10 above, and further in view of Teschner et al. (U.S. Pat. 5,968,082).

The difference not yet discussed is where the network is remotely linked (Claim 8)

Regarding claim 8, Teschner et al. teach utilizing a remote network for a device that detects arcs in a sputtering device. (See Abstract; Column 4 lines 62-64)

The motivation for utilizing the features of Teschner et al. is that it allows for monitoring the sputter apparatus. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Teschner et al. because it allows for monitoring a sputter apparatus.

Claims 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuzawa et al. (U.S. Pat. 6,080,292) in view of Abry et al. (U.S. Pat. 5,993,615).

Regarding claim 11, Matsuzawa et al. teach a method of monitoring a sputtering process. Providing a monitoring system comprising a sputtering source in a vacuum chamber, the sputtering source being connected to a power supply and a sensor box the sensor box including a current-based arc sensing device. Providing a data collection box connected to the sensor.

The differences between Matsuzawa et al. and the present claims is that a network connected to the data collection box is not discussed (Claim 11), the data collection box recording and displaying collected data is not discussed (Claim 11), inputting threshold values to the monitoring system is not discussed (Claim 11), measuring voltage values in the sputter source during each cycle of the sputtering process to determine when initiation of data collection occurs during each cycle is not discussed (Claim 11), measuring current values in the sputtering source during the sputtering process and comparing the measured current values to corresponding

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threshold values to determine when arcing occurs in each cycle is not discussed (Claim 11), indicating the status of the sputtering process based on the real time data collected is not discussed (Claim 11), displaying the measured results to monitor the conditions during the sputtering process in at least one of a table and graphical format is not discussed (Claim 12), determining the life of the target based on a number of kW hours the sputtering source has undergone is not discussed (Claim 13), indicating the status of the sputtering process comprises notifying an operator of conditions during the sputtering process by at least one of alarms, messaging, lighting and paging is not discussed (Claim 14), and the monitoring system is operable by a direct on-site computer or remotely by a network link is not discussed (Claim 15).

Regarding a network connected to the data collection box of claim 11, Abry et al. teach a method of monitoring a sputtering process. Abry et al. teach a network connected to the data collection box (i.e. PC). (Column 3 lines 25-30)

Regarding the data collection box recording and displaying collected data of claim 11, Abry et al. teach the data collection box recording and displaying collected data. (Column 4 lines 9-14)

Regarding inputting threshold values to the monitoring system of claim 11, Abry et al. teach inputting threshold values computer data. (Column 3 lines 63-68; Column 4 lines 1-8)

Regarding measuring voltage values in the sputter source during each cycle of the sputtering process to determine when initiation of data collection occurs during each cycle of Claim 11, Abry et al. teach measuring voltage values during the sputtering and

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recording when the voltage passes a threshold voltage. (Column 3 lines 63-68; Column 4 lines 18)

Regarding measuring current values in the sputtering source during the sputtering process and comparing the measured current values to corresponding threshold values to determine when arcing occurs in each cycle of Claim 11, Matsuzawa et al. already discussed teach measuring the current and when it exceeds a current value to determine arcing. (Column 4 lines 58-67; Column 5 lines 1-19)

Regarding indicating the status of the sputtering process based on the real time data collected of Claim 11, Abry et al. teach indicating the status of the sputtering process based on the real time data collected. (Column 4 lines 9-17)

Regarding displaying the measured results to monitor the conditions during the sputtering process in at least one of a table and graphical format (Claim 12), Abry et al. teach using graphs. (Column 4 lines 9-14)

Regarding determining the life of the target based on a number of kW hours the sputtering source has undergone (Claim 13), Abry et al. teach the life of the target based on a number of kW hours. (Column 4 lines 47-49)

Regarding indicating the status of the sputtering process comprises notifying an operator of conditions during the sputtering process by at least one of alarms, messaging, lighting and paging (Claim 14), Abry et al. teach the use of alarms. (Column 4 lines 14)

Regarding the monitoring system operable by a direct on-site computer or remotely by a network link (Claim 15), Abry et al. teach the monitoring system operable by a direct on-site computer. (Column 4 line 11)

The motivation for utilizing the features of Abry et al. is that it allows for preventing yield loss due to arcing. (Column 2 lines 9-10)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Matsuzawa et al. by utilizing the features of Abry et al. because it allows for preventing yield loss due to arcing.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M-Th with every Friday off..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Rodney G. McDonald/
Primary Examiner, Art Unit 1795

Rodney G. McDonald
Primary Examiner
Art Unit 1795

RM
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